

rites, sulphate of iron, and alum, are commonly found in such mines ; from which circumstances, together with the sulphureous odour emitted by most of the mineral coals when burned, the agency of sulphuric acid is strongly evinced ; and, as we have already observed, the coals formed artificially from vegetable substances, by means of sulphuric acid, bear a strong resemblance to the mineral coals, not only in their external characters, but also in their other properties.

Mr. Hatchett intends, he says, to relinquish any further prosecution of this subject for the present ; but he entertains such sanguine expectations of its proving economically useful, that he strongly recommends the prosecution of the inquiry, particularly of that part which relates to roasted vegetable substances and to peat.

*The Application of a Method of Differences to the Species of Series whose Sums are obtained by Mr. Landen, by the Help of impossible Quantities. By Mr. Benjamin Gompertz. Communicated by the Rev. Nevil Maskelyne, D.D. Astronomer Royal, F.R.S. Read February 13, 1806. [Phil. Trans. 1806, p. 147.]*

The nature of this paper is such, as renders it absolutely incapable of abridgement. By way of introduction to it the author observes, that having some years back, when reading the learned Mr. Landen's fifth memoir, discovered the manner of applying a method of differences to the species of series whose sums are there obtained by the help of impossible quantities, and having since extended that application, he now ventures to offer it to the consideration of others.

The practice of this method, in most cases, appears, he says, extremely simple, and on that account he is almost induced to imagine that it has already been considered by mathematicians. And he acknowledges that, since the greatest part of the paper was written, he has, in Euler's *Institutiones Calculi Integralis*, met with two simple series, which are in that work summed by multiplications similar to those employed in the investigation of the principal theorems contained in this paper. But whether that learned mathematician has pursued the method any further, he has not been able to ascertain.

Mr. Gompertz has purposely considered some of the series summed by Mr. Landen, in order to procure an opportunity of comparing both the results and methods ; and as the series may have particular cases, in which both Mr. Landen's means and those of our author fail, he has added, towards the end, a general Scholium concerning the causes, circumstances, and consequences of such failure.

*An Account of a small Lobe of the human prostate Gland, which has not before been taken notice of by Anatomists. By Everard Home, Esq. F.R.S. Read February 20, 1806. [Phil. Trans. 1806, p. 195.]*

The subject of this paper is a portion of a gland which, from the smallness of its size, and the obscurity of its situation, has hitherto

escaped observation ; and were it not for the change produced in it by disease, which sometimes enlarges it so much that it shuts up the urinary canal, it would, Mr. Home says, be little deserving of attention.

It is well known that the prostate gland is, in the latter periods of life, liable to enlarge ; in that case there is frequently a nipple-like projection, which forms tumours, of different sizes, in the cavity of the bladder. These tumours have engaged the attention of surgeons from the time of Morgagni to the present day ; but the peculiarities in the natural conformation of the gland which dispose it to form these tumours, have never been examined.

After stating the observations of Morgagni and of the late Mr. John Hunter upon the subject, Mr. Home says that his attention was directed to it by the examination of the prostate gland of an elderly person, who had died in consequence of this part having been diseased. The nipple-like process was very prominent, and a bridle nearly a quarter of an inch in breadth extended from the middle line of the tumour to the bulb of the urethra, where it insensibly disappeared. The usual rounded projection of the *caput gallinaginis* was not visible ; and the space between the tumour in the bladder and the bulb of the urethra was unusually short ; so that the bridle, which had evidently been formed by the membrane of the bladder adhering to that part of the prostate gland of which the tumour was composed, appeared to have drawn the bulb towards the tumour, and to have shortened the membranous part of the canal.

The above appearance of a bridle is more or less met with in all cases in which the nipple-like process occurs ; but in so small a degree, that Mr. Home had not before been led to pay attention to it. He now thought it right to examine the prostate gland in its natural state, in order to ascertain whether any part of it is sufficiently detached to move independently of the rest of the gland ; and as his professional avocations did not allow him sufficient time to make the requisite dissections, he committed that task to Mr. Brodie, demonstrator of anatomy to Mr. Wilson of Windmill-street. In consequence of Mr. Brodie's accurate examination of the part, a small rounded substance was discovered in the space between the two posterior portions of the gland : this substance was so much detached, that it seemed a distinct gland ; and it so nearly resembled Cowper's gland in size and shape, that it appeared to be a gland of the same kind. It could not, however, be satisfactorily detached from the prostate gland, nor could any distinct duct be found leading from it into the bladder.

A similar examination of the part was made in five different subjects. The appearance was not exactly the same in any two of them ; but our limits will not allow us to describe particularly the differences that were observed ; we shall therefore only say, that the most distinct appearance of the part was found in a healthy subject of twenty-five years of age. In this subject the prominent body was imbedded, not only between the *vasa deferentia* and the bladder, but

also, in some measure, between the lateral portions of the prostate gland and the bladder. It was evidently a lobe of the prostate gland ; and its ducts passed directly through the coats of the bladder, and opened immediately behind the verumontanum.

A still more distinct appearance of this lobe was afterwards found in a subject twenty-four years of age ; a representation of which accompanies this paper.

This newly acquired anatomical fact enables us, Mr. Home says, to understand the nature of a disease, of which we could not have a clear idea while we were ignorant of the existence of the part in which it originates : it also enables us to explain various circumstances respecting the disease, particularly what to our author has ever appeared the greatest difficulty, namely, the protrusion of the tumour into the cavity of the bladder. This protrusion arises from the hard substance of the coats of the *vasa deferentia* being in close contact, and bound down upon the lobe ; so that, from its first enlargement, it must press up the thin coats of the bladder. The situation of this lobe, and its connexion with the *vasa deferentia*, also render it liable to many causes of swelling, from which the body of the gland is free ; since every irritation of the seminal vessels, or of their orifices, may be communicated to it by continuity of parts.

There is much reason, our author says, to believe that the diseased state of the lateral parts of the gland, so common in the later periods of life, has its origin in the lobe here described ; for, in most of the cases examined by him, this lobe has been enlarged in a much greater degree, in proportion to its size, than any other part of the gland ; and the difficulty in passing the urine, which comes on very early in the disease, is, Mr. Home thinks, owing to the enlargement of this lobe ; since an enlargement of the lateral portions of the gland widens the canal instead of diminishing it. The enlargement of the lobe also occasions the bladder to retain a considerable part of the urine ; and as the urine passes in a stream, and the quantity voided is sufficient, no suspicion is entertained of the cause of the frequency and distress in passing it ; but they are referred to an irritable state of the coats of the bladder.

From the above observations it appears that the small lobe of the prostate gland here treated of is, from its situation and the circumstances in which it is placed, more liable to become diseased than any other part of the gland ; and that it produces symptoms of danger and distress which are peculiar to itself, but which have been hitherto supposed to arise from the body of the gland becoming enlarged.

*On the Quantity and Velocity of the Solar Motion.* By William Herschel, LL.D. F.R.S. Read February 27, 1806. [Phil. Trans. 1806, p. 205.]

The present paper is a continuation of that communicated to the Society by Dr. Herschel last year, in which he considered the direc-